

## **Appendix C. Main Study Survey Administration**



# **Base Survey Administration Report**

## **Oklahoma Watershed Study**

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## Introduction

This report documents the survey activities during the base survey Westat conducted for Stratus Consulting. The training was conducted from September 17-19, 2008 in Oklahoma City, Oklahoma. Data collection began immediately afterward on September 20th and ended on December 7th. Westat completed 1,637 interviews on its computer-assisted personal interviewing (CAPI) system. The results of each of the major steps in the survey process are described on the next page.

## Sample Design

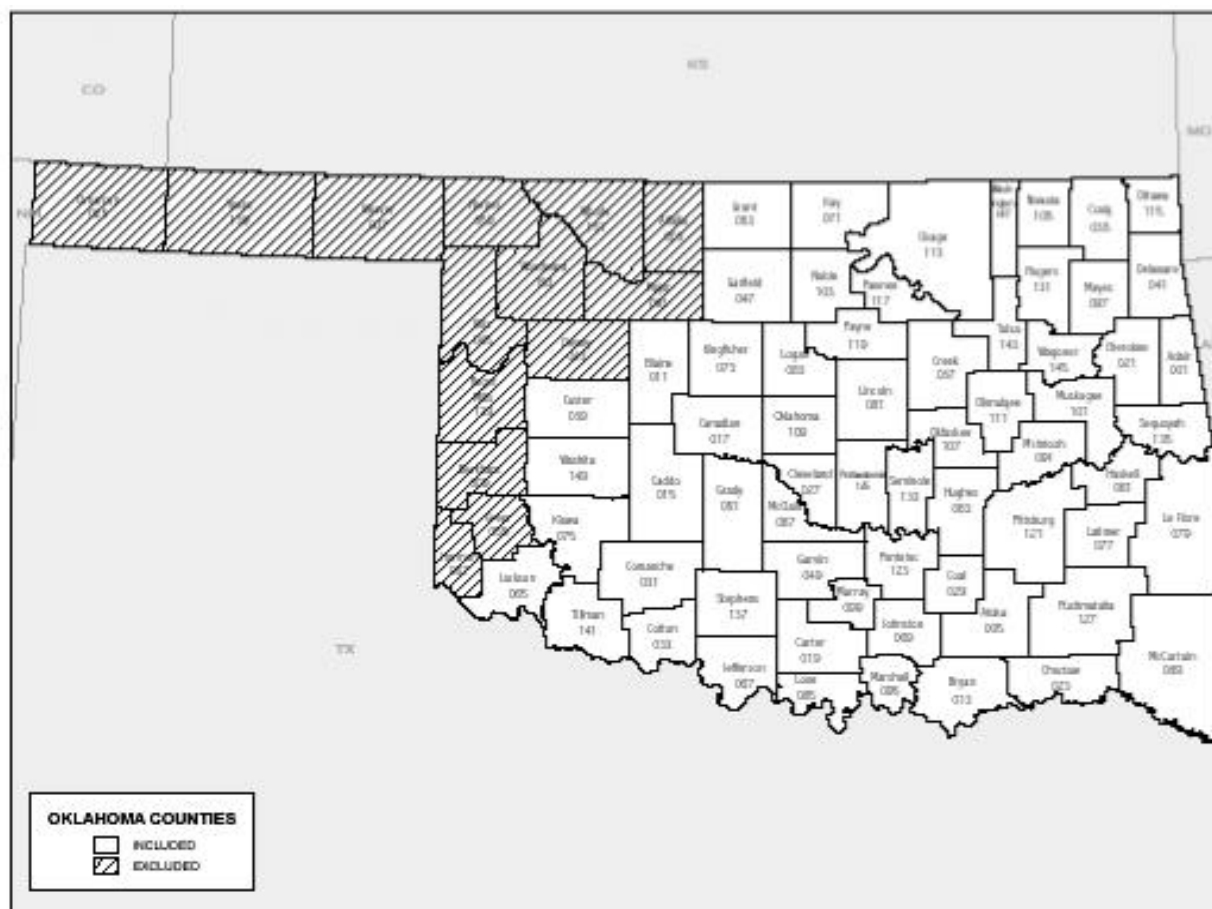
The sample design for the Oklahoma Watershed Survey was a multi-stage area probability sample consisting of ZIP code areas at the first stage and groups of Census-defined blocks (segments) at the second stage. In segments where commercially available United States Postal Service (USPS) mailing lists were expected to have good coverage, a sample of dwelling units was drawn from these address-based lists. In areas where the address lists were deemed to be inadequate, a sampling frame of addresses/descriptions of dwelling units was created in the field using traditional listing methods. The third-stage samples of dwelling units were drawn from either the address-based or field-listed frames. At the fourth stage of sampling, one adult was randomly sampled from all adults living in the household. For a subsample of segments, special quality control and coverage improvement efforts were applied to account for residences that otherwise would not have had a chance of selection into the sample.

### 2.1 Target Universe

In order to construct the sampling frames and draw the samples, several definitions were operationalized. As indicated in Figure 2-1, the geographical area covered by the study was the state of Oklahoma except for the following western counties: Alfalfa, Beaver, Beckham, Cimarron, Dewey, Ellis, Greer, Harmon, Harper, Major, Roger Mills, Texas, Woods, and Woodward. Removing these counties from the target universe removed 24 percent of the geographic area of the state while only excluding about 3 percent of the population. (This figure is based on the Census Bureau estimates of county population, as of July 1, 2006). The population of interest was the adult (persons 18 years of age or older) civilian noninstitutionalized population within this geographic area. Persons living in group quarters such as nursing homes, prisons, military barracks, convents, or monasteries were ineligible for the survey. Persons 18 years or older who were considered part of a sampled household but who were not in residence during the study period were also ineligible for the survey.

In general, students 18 years or older living in college dormitories are considered to be included in the target population; however, in practice their inclusion would have raised significant operational difficulties. Since college dormitory rooms are not always included in USPS address lists as separate

**Figure 2-1. Counties included in Oklahoma Watershed Survey**



addresses (e.g., this will usually depend on how the college handles mail distribution on campus), the address lists generally do not cover this subset of the population. Special procedures to develop lists of college dormitories and obtaining permission from the college to conduct the survey on campus would have been costly and time-consuming. On the other hand, those students 18 years or older living in off-campus housing with valid mailing addresses will have a chance of being included in the survey. To partially offset the loss of students living in dorms, any students found living in a sampled household during the study period was considered to be eligible for the survey.

## 2.2 Primary Sampling Units

The first stage sampling unit, called the primary sampling unit (PSU), was defined to be a USPS ZIP code area. Specialized computer software was used to uniquely assign Census blocks to ZIP code areas within the targeted counties of the state. The initial geocoding of Census blocks resulted in 518 PSUs. However, 21 of these contained fewer than 100 housing units, the minimum size deemed

efficient for sampling purposes. These 21 ZIP code areas were combined with nearby ZIP code areas with similar characteristics, resulting in a final sampling frame of 497 PSUs. This sampling frame, or list, of 497 primary sampling units consisting of zip codes or groups of zip codes, covers the entire target area of Oklahoma.

### 2.2.1 Certainty PSUs

The sample plan for the Primary Sampling Units was to select 90 of them, with the probability of selection proportional to their size as measured by the number of housing units in each PSU. For any PSU containing more than 1/90th of the total housing units in the target universe, this plan would yield a sampling probability greater than 100 percent. Since probabilities cannot be more than 100 percent, or a sure thing, such large PSUs are selected with certainty as the first step in PSU sampling. These large PSUs are generally referred to as certainties. Another term often used for these large PSUs selected with probability 100 percent is “self-representing”.

In the current study, the estimated number of housing units (HUs) in the target universe is 1,461,465 based on 2000 Census data.<sup>1</sup> One-ninetieth of this total is 16,238. To ensure that borderline large PSUs would also be included in the sample, a slightly lower cutoff of 14,000 was used to determine which PSUs would be selected with certainty. As a result, 12 PSUs were chosen with certainty. In order to end up with 90 PSUs, 78 more had to be drawn with probabilities less than 100 percent. These PSUs are designated noncertainties to distinguish them from the 12 certainty PSUs. The next section describes their selection process.

### 2.2.2 Noncertainty PSUs

In order to allow for estimation of variance of the sampling results, the 78 noncertainty PSUs were selected in pairs from 39 sampling strata. These strata, or groups of PSUs, were designed following two principles: keep similar PSUs together and create strata with approximately equal numbers of housing units. The first principle spreads the sample across the types of PSU and the second

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<sup>1</sup> Block-level data from the 2000 Census were used in the PSU formation process. Although more current data from the American Community Survey (ACS) are available for the entire state and selected geographic areas within the state, block-level statistics required for sampling are not available from the ACS.

ensures that the probabilities of selection can be proportional to size and also yield two PSUs per stratum.

The first step in forming the 39 sampling strata was to divide the remaining 485 (497 minus 12 certainty) noncertainty PSUs in the sampling frame into four regions, so that the final sample would have good geographic dispersion across the state. These regions were defined largely by county, although in a few cases PSUs were included in an adjacent county to ensure that each resulting “region” could be subdivided evenly into the required number of strata. Table 2-1 summarizes the estimated number of HUs, number of strata, and number of PSUs in the noncertainty PSU sampling frame by region.

**Table 2-1. Noncertainty PSU Frame**

Region	Counties	Number of HUs	Number of strata	Number of PSUs
1	Caddo, Carter, Comanche, Cotton, Custer, Garvin, Grady, Jackson, Jefferson, Kiowa, Love, McClain, Murray, Stephens, Tillman, Washita	164,579	5	108
2	Blaine, Canadian, Cleveland, Garfield, Grant, Kay, Kingfisher, Logan, Oklahoma	387,973	12	103
3	Adair, Cherokee, Craig, Creek, Delaware, Kay, Lincoln, Mayes, McIntosh, Muskogee, Noble, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Payne, Pottawatomie, Rogers, Sequoyah, Tulsa, Wagoner, Washington	550,818	17	170
4	Atoka, Bryan, Choctaw, Coal, Haskell, Hughes, Johnston, Latimer, LeFlore, Marshall, McCurtain, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, Seminole	162,081	5	104
<b>Total</b>		<b>1,265,451</b>	<b>39</b>	<b>485</b>

The next step was to assign the PSUs within each region to strata based on level of urbanicity (percent of housing units in the PSU that are in rural areas) and minority status (based on percent of Hispanic and nonHispanic/nonwhite persons in the PSU). For example, as indicated in Table 1, five strata were to be created in regions 1 and 4 in the southern part of the state. For these two regions, two categories of urbanicity were created in such a way that one had about 2/5ths of the total number of HUs and the other had 3/5ths. The first group was further subdivided into low and high percent minority strata, while the second group was subdivided in low, medium, and high percent minority strata. In forming the strata, the goal was to equalize the number of HUs across the strata to the extent possible. Region 2 (containing most of Oklahoma City) and region 3 (containing the

remainder of Oklahoma City and Tulsa) were initially divided into 3 and 4 categories of urbanicity, respectively. Next, between 2 to 6 strata defined by minority status were formed within the urbanicity groups. In some cases, a PSU near the boundary of two categories was moved to the other stratum to equalize the stratum sizes. Within the 39 noncertainty strata formed in this manner, two PSUs were drawn from each stratum with probabilities proportional to the number of housing units.

## 2.3 Second-Stage Sampling Units

The second-stage sampling units were “segments” defined to be Census-defined blocks or groups of blocks. To create the segments, a list of all addresses in the Zip Codes associated with the sampled PSUs was purchased from a licensed vendor. These addresses were then geocoded to determine the Census blocks to which they belonged. Of the 713,012 addresses purchased in the 94 Zip Codes associated with the 90 PSUs, 640,880 were geocodable (i.e., could be assigned into a Census block).

These addresses were sorted by Zip Code and then by block. Block records were formed containing the Census housing unit count, the number of addresses geocoded into the block, and identifying information. Each block record was then assigned the larger of the Census count or the number of addresses as a preliminary block measure of size. Nearby blocks were then combined if necessary to form segments with a minimum measure of size of 30, where the measure of size for each segment was computed by adding up the larger of the total Census housing unit count and number of geocoded addresses for the member blocks.

To select the sample, the segment list was sorted by PSU and within PSU by the segment measure of size. A systematic sample of 420 segments was drawn from the sorted list with probabilities proportional to a sampling measure of size defined to be the segment measure of size times the inverse of the PSU selection probability. Including the inverse of the PSU selection probability in the calculation of the sampling measure of size at this stage of selection was designed to compensate for the initial selection of PSUs.

The selected segments were then evaluated for coverage using the ratio of the number of addresses geocoded into the segment to the number of housing units reported in the 2000 Census. Segments for which this ratio exceeded 75 percent were designated “address list” segments, and the remaining segments were designated “field listing” segments. This resulted in designating 282 of the 420 segments as “address list” segments and the remaining 138 as “field list” segments.

## Selection of Dwelling Units

For the 282 address list segments, dwelling units (addresses) were sampled directly from the list of USPS addresses that had been geocoded to that segment. Within each segment, the addresses were first sorted by carrier route and delivery order number. Ten addresses per segment were then systematically sampled the sorted list, resulting in a total sample of 2,820 addresses.

For the 138 field listing segments, trained field staff traveled throughout the selected segment to create lists of dwelling units following prescribed instructions to ensure complete and accurate coverage. These lists were transmitted to the home office, where a sample of dwelling units was drawn. To control interviewer workload, the number of dwelling units to be selected was determined by comparing the expected number of dwelling units (based on the overall segment selection probability and the number of dwelling units listed in the segment) with the target number of ten dwelling units per segment. If the expected number was between 8 and 12, 10 dwelling units were drawn. For segments where the expected number was below 8, 6 to 8 dwelling units were typically drawn. For segments where the expected number was greater than 12, up to 20 dwelling units were drawn.

Of the 138 segments designated for field listing, one segment contained no dwelling units (it was a temporary camp ground) and four segments were inside gated communities. In the case of the four gated communities, alternative procedures were used to develop lists of dwelling units because the field listers were denied entry into the compound to obtain the required information about the dwelling units. From the 137 segments with potentially eligible dwelling units, 1,386 dwelling units were initially sampled. For those cases for which a specific address was obtained (rather than a description such as “unnumbered red house on the corner of 1st and Main St”), the addresses were compared with the frame of purchased addresses. In some instances the matched addresses were found to be on address lists for segments which were designated as address list segments. In order to avoid giving these cases a double chance of selection, they were deleted from the field list sample. A total of 99 cases were deleted during this process, leaving an initial sample for the field listed segments of 1,387 dwelling units. The total initial sample size was therefore 4,107 (2,820+1,287).

### 3.1 Reduction of the Sample

After data collection was underway, a decision was made to reduce the sample size in order to focus efforts on a smaller set of the outstanding cases with the goal of improving response rates. Thus, 931 of the 4,107 cases in the initial sample were randomly “deselected” from the sample. The deselections were made from the roughly 3,000 cases that had not yet been completed or finalized at the time the decision was made. Thus, prior to implementation of the procedures described in the next section, a total of the 3,176 addresses/dwelling units were included in the active sample. To compensate for the deselection (i.e., “two-phase sampling”) process in the calculation of response rates, weights equal to the reciprocal of the probability of retaining a case for the sample were assigned to the retained cases (e.g., see Appendix A.6 for more information about the calculation of weighted response rates).

### 3.2 Quality Control Procedures

Quality control (QC) procedures were implemented to minimize the potential for undercoverage of dwelling units in both the address and field listed segments. In the case of the field listed segments, the procedure used to extend coverage to missed or new dwelling units is referred to as the Waksberg “missed structures/missed DU” procedure. As the name suggests, there are two components of the procedure. The purpose of the “missed structures” procedure was to ensure that no dwelling units were missed during the original listing process. Under the missed-structures procedure, field staff conducted a thorough check of the dwelling units for a randomly selected subsample of segments. A total of 41 segments (including 27 address segments and 14 field listed segments) was designated for the missed structures procedure. Any dwelling units that were found to have been omitted from the segment for sampling purposes (e.g., missed or new units that would otherwise not have had a chance of selection) were then added to the survey sample. Seventy-six DUs in the address segments (and none in the field listed segments) were added to the sample as a result of this procedure.

The second component of the QC procedures, referred to as the “missed dwelling unit (DU)” procedure, applied primarily to apartment buildings or complexes with multiple dwelling units. The purpose of this procedure was to check for units that were inadvertently omitted or overlooked in the original listing process. This procedure was applied to a randomly selected subsample of the apartment buildings/complexes included in the original sample. For those apartment

buildings/complexes designated for the missed DU procedure, interviewers were instructed to confirm that all units were included in the original listings. Like the missed structures procedure, any missed units found by the interviewer were added to the sample. Only one DU was added to the sample as a result of the missed DU procedure.

The two quality control procedures described above are relatively straightforward to implement for traditional area samples such as the field listed segments which employ physical locations and detailed segment maps to identify any missed or new units. In the case of the address segments, however, some mailing addresses cannot be geocoded to a Census block due to limitations of the geocoding software. Additionally, the geocoding software may place addresses in the wrong segment, and lead to uncertainty as to whether a given address could have had a probability of selection though field listing. Also, the purchased lists may be out of date, and in a rapidly growing area, large numbers of new structures may be found during the field period after the sample has been drawn. For these reasons, a modification of the standard missed structures/missed DU procedure was used in the address segments. Under the modified procedure, field staff prepared a list of addresses for any structures in the selected segment that were not included in the USPS-derived segment sampling frame. However, in this situation (as discussed in Dohrmann et al, 2006<sup>2</sup>), there are complications arising from the fact that addresses can be assigned to the wrong segment due to imperfect geocoding. Thus, it was necessary to compare the dwelling units found through the missed structures procedure with the lists of USPS addresses in neighboring segments. If the (missed or new) dwelling unit appeared on the frame in another address segment, it was not considered to be a missed/new structure. Only if it was completely missed by all frames and was not assigned to a segment that would have been field listed, was it considered to be a missed structure, and given a probability of being added to the sample. Like the field listed segments, the missed DU procedure was also applied to a randomly selected subsample of apartment buildings/complexes in the address segments.

Finally, for all sampled dwelling units, an effort was made during the interview to identify separate living quarters (such as basement apartments, “out buildings,” or trailers) that would not otherwise have been listed in either the address or field listed segments. Such units are referred to as “hidden DUs” and were added to the sample. A total of 10 hidden DUs was added to the sample, bringing the total sample size to 3,263. Table 3-1 summarizes the distribution of the sample by type of segment and sampling procedure. The final dispositions of the 3,263 sampled dwelling units are summarized in Section 10.

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<sup>2</sup> Dohrmann, S., Han, D., and Mohadjer, L. (2006). Residential Address Lists vs. Traditional Listing: Enumerating Households and Group Quarters. *JSM Proceedings, the ASA Section on Survey Research Methods*, pp 2959-2964

**Table 3-1. Distribution of sampled DUs by type of segment and procedure**

Type of segment	Number of segments in sample	Number of DUs selected and retained for sample*	Number of segments selected for missed structures procedure	Number of DUs added via missed structures procedure	Number of DUs added via missed DU procedure	Number of DUs added via hidden DU procedure	Total number of sample DUs
Address	282	2,354	27	76	1	2	2,433
Field listed	138	822	14	0	0	8	830
<b>Total</b>	<b>420</b>	<b>3,176</b>	<b>41</b>	<b>76</b>	<b>1</b>	<b>10</b>	<b>3,263</b>

\* Reflects active cases after sample reduction (see Section 3.1).

### 3.3 Selection of Individuals

Completed screener interviews (including a roster of eligible adults living in the household) were obtained for 1,793 of the 3,263 sampled DUs (see Section 10). In general, a person had to be 18 years of age or older and a member of the household at the time of screening to be eligible for the extended interview. At the fourth and final stage of sampling, the CAPI screening instrument randomly selected one of the eligible adults to answer the extended interview. This meant that appointments often had to be made to complete the extended interview if the selected adult was not also the screener respondent. A total of 1,793 persons was selected for the extended interview. Table 3-2 summarizes the distribution of the sampled individuals by region and number of eligible persons (i.e., persons 18 years of age or older at the time of screening) in the household.

**Table 3-2. Distribution of sampled persons by region, sex, and age group**

Region	No. persons 18+ years in household				Total
	1	2	3	4+	
<b>1</b>	86	132	26	4	248
<b>2</b>	225	231	32	6	494
<b>3</b>	350	378	71	18	817
<b>4</b>	84	122	22	6	234
<b>Total</b>	<b>745</b>	<b>863</b>	<b>151</b>	<b>34</b>	<b>1,793</b>

## Interviewer Recruitment

The recruitment effort was spearheaded by two Westat field managers. Recruitment lists of available, Oklahoma field staff, with interviewing experience, were generated using the Westat Field files system. An ad was placed on the Westat web site. Ads were twice placed in Oklahoma City and Tulsa newspapers and once on the Oklahoma State Employment site. The recruiters networked with other Westat projects and with contacts outside the company. In some cases, we were able to share personnel with other projects. Interviewers from states surrounding Oklahoma and further were recruited to work on travel status. Forty-six interviewers came to training including six from the two pilot studies.

## Interviewer Training

Forty-six interviewers attended the September 17-19, 2008 interviewer training in Oklahoma City, Oklahoma. Nineteen of these interviewers lived in Oklahoma, and twenty-three interviewers were travelers, residing in other states. Fifteen of the 46 interviewers were new interviewers and attended the General Interviewer Training (GIT) on Tuesday evening. Topics and procedures covered in the GIT training were:

- The Art and Science of Interviewing – Asking Questions, Probing for Complete Answers, and Keys for Gaining Respondent Cooperation; and
- Laptop orientation.

The first day of the main study training covered definitions of dwelling units and tips about doing household interviews as presented by interviewers from the first two pilot studies. Trainees also practiced introducing the study, confirming that an eligible screener respondent was available and administering the CAPI screener which included enumerating the household and randomly selecting the survey respondent. Interviewers also became familiar with their laptops and took the self guided CAPI training modules. On the second day of training, the survey designers reviewed the survey instrument in detail, using the study show cards and maps. Interviewers later worked in dyads taking turns playing the respondent and the interviewer, and practiced administering the screener interview and the extended interview. Role-plays involved the use of probes, locating previously reported information in the interview and recording information the respondent would like to know more about.

Interviewers were also trained on the Missed DU procedure, a quality control procedure to check the accuracy of the USPS listings and the traditional field listing process. Interviewers were also trained on such record keeping practices as documenting contact attempts and the use of the Non-Interview Report Form or NIRF when he or she failed to complete a screener and/or extended interview with a sampled household.

## Interviewer Supervision

Two field managers were located in Washington, DC. The three field supervisors, all Oklahoma residents and located in Oklahoma, were in daily phone contact with the interviewers. The Field supervisor in Oklahoma was responsible for the out-of-state interviewers. Another field supervisor was responsible for local interviewers, chiefly in the Oklahoma City area. Both reported to a Washington field manager. Another Oklahoma field supervisor was responsible for local interviewers, primarily in the Tulsa area and reported to the other field manager. Field supervisor duties included frequent telephone contact and in-person supervision as required. Two of the field supervisors conducted interviews in addition to their supervisor duties. The field managers were in daily telephone contact with the field supervisors. They discussed interviewer productivity and strategies to increase interview completion; reassigning work when appropriate. The field managers were often in contact with interviewers directly providing encouragement and answering questions. The field supervisors reviewed and sent interviewer time and Expense reports to the Field Manager for final approval. The interviewers received help with computer issues from Westat Helpdesk personnel.

## Quality Control Edits

Quality control edits were built into the Blaise program. The Blaise program is a commercial program used for programming surveys in a laptop computer environment. These edits prevented certain types of errors, involving out of range and inconsistent answers; the relevant range and logic checks were incorporated into the Blaise interview. The edits are made as the interviewer is conducting the interview, so the interviewer must resolve any problems on the spot. The Blaise application also prevents the interviewer from skipping any items that are required. After the data are collected, data management staff reviewed frequency distributions and cross-tabs, looking for inconsistencies in the data that were not caught by the edits built into the Blaise program. Any problems discovered were documented in a memo that explained the data issues. The data issues were discussed in project meetings with project staff. Changes were made by the programmers and documented in the decision log. The decision log is a quality control document containing all changes and decisions pertaining to the data. Data management staff also reviewed the frequency distributions after the data changes are made. Data management staff made changes to text fields, correcting “typos” only. This is also documented in the decisions log.

## Base Survey Data Collection

There were 420 segments selected in the base study, 282 segments were located in the suburban-urban areas of Oklahoma City and Tulsa, the surrounding areas and around the state. There were 138 segments located in more rural areas. These segments were listed in August during a 3 week period prior to the start of data collection in late September. Statisticians selected 10 addresses per segment in the address list segments and between 8-20 addresses in the field listed segments depending on the estimated number of dwelling units. Case assignments were made by geographically clustering segments. Each interviewer had an assignment of between 50 – 150 cases over the course of data collection. Interviewers began interviewing in the Oklahoma City and Tulsa areas, and traveled to and interviewed in the more rural areas after they had successfully worked their cases in their original assignment. The Field Supervisor reassigned cases, as needed.

Interviewers first verified that they had located the correct address. Interviewers then attempted to contact each household and administer the screener to an adult respondent (18 years old or older and a resident of the household) who lived there. Interviewers then switched to a CAPI screener component during which they enumerated the household members and randomly selected an extended interview respondent. The screening interview took approximately 5-8 minutes, while the extended interview took between 30-60 minutes to administer. Interviewers utilized show cards, pictures, and maps when administering the extended interview.

When no one was at home, interviewers left a “Sorry I Missed You” card on which they recorded their name and telephone number, and also left an extra copy of the study Advance Letter. A Telematch search was conducted by the Westat Home Office, and the 728 names and telephone numbers associated with the sampled addresses were found (out of 1,765 workable/pending cases or a 41% yield). These telephone numbers were forwarded to the interviewers. Interviewers also used “White Pages” searches on the Internet and other tracing strategies.

After the deselection procedure was implemented in mid October, a refusal conversion mailout was sent using FedEx to 266 out of the 426 households for which we had usable delivery addresses and which were not hard refusals on October 27<sup>th</sup>. Initial refusal cases were reviewed and based on the gender, race and age of the respondent, as well as the reason for the refusal were reassigned to another interviewer, as warranted. On December 1<sup>st</sup>, another refusal conversion mailout was sent to

306 out of 427 households for which we had usable delivery addresses and which were not hard refusals for those initial refusals occurring during November.

## Validation of Interviews

Validations of completed extended interviews were conducted in the field by the three Field Supervisors and by the Home Office. Periodic queries were run to identify the dwelling unit ID (DUID), the respondent's name and telephone number, the date and time of the interview, the name of the interviewer, and the length of interview time. Interviews that had missing or unlikely telephone numbers were pulled, and contact information was determined through tracing methods, or a Field Supervisor made an in-person visit, as needed. Telephone calls were made to the selected respondent to validate that an interview had been completed, and interviewers verified the critical information provided and probed about the purpose and content of the interview, and about the interviewer in question. Across interviewers, approximately 15 percent of each interviewer's completed interviews were validated.

## Sample Completion

Table 10-1 summarizes the final dispositions of the 4,278 cases that had been loaded into the sample management system (SMS). Of these, 1,015 were deleted because they had been “sampled in error” or were deselected as described in Section 3.1. The former were cases sampled from field listed segments that had been loaded into the SMS, but were later deleted from the sample because they were determined to be duplicates of addresses in the USPS address frames (e.g., see discussion in Section 3 on sampling DUs in segments designated for field listing). This left a total of 3,263 cases in the final sample.

Of the 3,263 sampled cases, 1,793 completed the screener. Of the remaining 1,470 cases that did not complete the screener, 378 were ineligible (i.e., vacant - code 35, nonDU - code 36, or bad address - code 37). Among the remaining 1,092 *eligible* nonresponding DUs, 404 (37.0%) were not completed due to maximum calls (code 32) and 564 (51.6%) were final refusals (code 33). These two types of nonresponse accounted for 88.6 percent of the eligible nonresponding DUs. The 60 cases in which the respondent was too ill/unavailable to complete the screener (code 40) accounted for another 3.7 percent of the eligible nonrespondents.

Because the sample reduction described in Section 3.1 applied only to cases that had not yet been finalized at the time the subsampling was done, the corresponding survey response rates must be computed using appropriate weights that reflect the deselection process. The method used to weight the sample for response rate calculations and the resulting weighted response rates are presented in Appendix A.6.

Table 10-1. Number of cases in sample management system (SMS) by final status code

Final Status Code	Number
<b>Total in SMS</b>	<b>4,278</b>
Cases deleted from SMS:	1,015
39[F]-Ineligible - sampled in error	83
90[F]-Deselected Rnd 1	931
92[F]-Ineligible - sampled in error	1
Cases completing screener:	1,793
32[F]-Not Home [Max calls]	29
33[F]-Final Refusal	86
34[F]-Language Problem	3
35[F]-Final Vacant	2
37[F]-Bad Address	1
38[F]-Other [specify in comments]	1
40[F]-Too Ill/Unavailable	28
83[F]-Complete (Screener and Extended Interview)	1,637
91[F]-Complete w/Bad Data	6
Cases not completing screener	1,470
32[F]-Not Home [Max calls]	404
33[F]-Final Refusal	564
34[F]-Language Problem	46
35[F]-Final Vacant	260
36[F]-Not a DU	85
37[F]-Bad Address	33
38[F]-Other [specify in comments]	3
40[F]-Too Ill/Unavailable	60
94[F]-Complete w/Falsify	15

# Sample Weights

## 11.1 Role of Weights

The purpose of calculating sample weights is to permit inferences from the sampled persons (SPs) to the population from which they were drawn. Weighting accomplishes the following objectives:

- By weighting inversely to sampling probabilities at each stage of sampling, it takes account of the fact that all persons in the population did not have the same overall probability of selection;
- By adjusting for nonresponse within groups defined by their response propensity it minimizes potential biases arising from differences between cooperating and noncooperating sample persons;
- It reduces the impact of possible coverage biases through the use of auxiliary data to poststratify the sample along a number of key dimensions of the population;
- It reduces the variation of the weights if necessary to prevent a small number of observations with extreme weights from dominating weighted estimates; and
- It facilitates sampling error estimation using replication methods.

The specific weighting steps implemented for the Oklahoma Watershed Survey are described below.

## 11.2 Calculation of Weights

For the Oklahoma Watershed Survey, the final analysis weight for each sampled person has the following general form:

$$W_{SP}^{final} = W_{PSU} W_{(w)seg} W_{(w)DU} G_{DU}^{(1)} G_{DU}^{(2)} R_{DU}^{NR} W_{(w)SP} R_{SP}^{NR} R_{SP}^{PS} \quad (1)$$

The components of the final weights are explained in the sections below.

### 11.2.1 PSU Weight, $W_{PSU}$

Of the 90 PSUs in the sample, 12 were selected with certainty and therefore have  $W_{PSU} = 1$ .

The remaining 78 noncertainty PSUs were assigned to 39 strata, from which 2 PSUs per stratum were drawn systematically with probabilities proportionate to a measure of size (MOS) equal to the number of housing units in the PSU. Thus, for a noncertainty PSU in a given stratum,

$$W_{PSU} = M_{strat} / (2 M_{PSU}), \quad (2)$$

where  $M_{PSU}$  is the MOS of the PSU and  $M_{strat}$  is the total MOS of all PSUs in the stratum.

### 11.2.2 Within-PSU Segment Weight, $W_{(w)seg}$

On average, 4-5 segments were selected from each PSU resulting in a total of 420 segments. Within a PSU, segments were selected with probabilities equal to

$$P_{(w)seg} = 420 W_{PSU} M_{seg} / \hat{M}$$

where

$M_{seg}$  = the MOS (essentially, the number of housing units) of a given segment; and

$$\hat{M} = \sum_{h=1}^{90} W_{PSU,h} \sum_{i=1}^{S_h} M_{seg,hi}.$$

In this expression,

$W_{PSU,h}$  = the weight of sample PSU  $h$ ;

$M_{seg,hi}$  = the MOS of the  $i$ th segment in PSU  $h$ ; and

$S_h$  = the total number of segments in PSU  $h$ .

The within-PSU segment weight was computed as:

$$W_{(w)seg} = 1 / P_{(w)seg} \quad (3)$$

### 11.2.3 Within-Segment Dwelling Unit (DU) Weight

#### 11.2.3.1 Within segment Dwelling Unit (DU) Sampling Weight, $W_{(w)DU}$

The basic within-segment dwelling unit (DU) weight was computed as

$$W_{(w)DU} = N_{seg} / n_{seg} \quad (4)$$

where

$N_{seg}$  = the total number of DUs in the segment; and

$n_{seg}$  = the corresponding number of sampled DUs.

#### 11.2.3.2 Dwelling Unit (DU) adjustment factors for special sampling procedures, $G_{DU}^{(1)}$ and $G_{DU}^{(2)}$

The factor  $G_{DU}^{(1)}$  is a DU-level adjustment reflecting the subsampling of segments for the missed-structures procedure.

$$\begin{aligned} G_{DU}^{(1)} &= 2 \text{ if the DU was added to the sample through the missed structures} \\ &\quad \text{procedure;} \\ &= 1, \text{ otherwise.} \end{aligned}$$

The factor  $G_{DU}^{(2)}$  is a DU-level adjustment reflecting the deselection of cases in the second phase of sampling to reduce sample size (see Section 3.1).

$$G_{DU}^{(2)} = 1/f_{sub} \text{ where } f_{sub} \text{ is the probability of retaining the DU at the second} \\ \text{phase of sampling.}$$

The value of  $f_{sub}$  used was 0.71.

### 11.2.3.3 Summary of Results in Creating Base Weights

The product of the factors described thus far constitutes the DU base weight. For the cases in the final sample, the sum of the base weights was 1,510,483. The mean DU base weight was 462.77, and the coefficient of variation (CV) of the DU base weights was 22.89 percent. The CV of the base weights is informative because  $1 + (CV/100)^2$  represents an unequal-weighting design effect or “variance inflation factor” due to unequal weighting of the sampled DUs. In this case, the unequal weighting design effect is 1.05.

### 11.2.4 Adjustment of DU Weights for Nonresponse, $R_{DU}^{NR}$

The first stage of nonresponse adjustment was made at the DU level. The base weights were adjusted to account for nonresponse and ineligibility discovered while attempting to administer the household screening and roster instrument. The DU base weights, the product of the first five factors in equation (1) above, were used in calculating the nonresponse adjustment factors within adjustment cells.

Adjustment cells were defined by region, and by several segment level variables based on the 2000 SF1 Census block files. The cells were developed using a CHAID algorithm in which cases with similar response propensities were grouped into homogeneous cells defined by available input variables. The variables which proved significant and were used to form adjustment cells were: sampling region, percent adults in segment (defined as a categorical variable), percent of American Indians in the segment (defined as a categorical variable), average size of household in the segment, the ratio of the number of addresses in the segment from the USPS sampling frame to the corresponding 2000 Census housing unit count (a rough measure of the coverage of the USPS frame), and the percent of the population in the segment residing in rural areas. A total of 12 adjustment cells was formed as indicated in Table 11-1.

Table 11-1. Definition of adjustment cells for dwelling unit (DU) nonresponse adjustment

DU non response adjustment cell	Region*	% adult in segment (2000 Census)	% American Indian in segment (2000 Census)	Average number of persons per housing unit in segment (2000 Census)	Ratio of number of addresses (USPS) to housing unit count (2000 Census)	% of population in rural areas, by segment (2000 Census)
1	1, 3	Less than 70%	Less than 5%; or more than 20%	All values	All values	All values
2	1, 3	Less than 70%	5%-20%	All values	All values	All values
3	1, 3	70%-74%	All values	Less than 1.5 to 1.99; or 3 or more	Less than 75%; or 90-99%	All values
4	1, 3	75%-79%	All values	Less than 1.5 to 1.99; or 3 or more	Less than 75%; or 90-99%	All values
5	1, 3	70%-79%	All values	Less than 1.5 to 1.99; or 3 or more	75%-89%; or 100% and over	All values
6	1, 3	70%-79%	All values	2 to 2.99	All values	All values
7	1, 3	80% or more	All values	All values	All values	Less than 10%
8	1, 3	80% or more	All values	All values	All values	More than 10% and less than 100%
9	2	All values	All values	Less than 1.5 to 1.99 ; or 2.5 to 2.99	Less than 75%	All values
10	2	All values	All values	2 or more	Less than 75%	All values
11	2	All values	All values	All values	75% and over	All values
12	4	All values	All values	All values	All values	All values

\* See Table 1 in Section 2 for definition of regions defined for sampling.

The nonresponse adjustment factor  $R_{DU}^{NR}$  was computed as the ratio of the weighted count of all eligible sampled DUs in the cell to the corresponding weighted count of responding DUs (those with completed screeners). Table 11-2 summarizes the number of responding cases, weighted counts, and the DU nonresponse adjustment factor for each adjustment cell.

Table 11-2. Weighted counts\* and DU nonresponse adjustment factors by adjustment cell

DU non response adjustment cell	Number of screener completion cases in cell	Weighted count of responding DUs	Weighted count of nonresponding DUS	Weighted count of ineligible DUs	Total weighted count of sampled DUs	Non response adjustment factor
1	150	58260	16631	14117	89008	1.29
2	141	57854	37043	15439	110335	1.64
3	47	20133	2371	4663	27166	1.12
4	65	28283	9510	5868	43661	1.34
5	39	15481	11086	6509	33076	1.72
6	412	181281	131957	38241	351479	1.73
7	161	69809	69991	21945	161744	2.00
8	50	18731	7812	4022	30565	1.42
9	51	14485	11181	4831	30496	1.77
10	76	40646	11183	7551	59380	1.28
11	367	162572	198267	46117	406957	2.22
12	234	100102	45822	20690	166614	1.46
<b>Total</b>	<b>1793</b>	<b>767635</b>	<b>552854</b>	<b>189994</b>	<b>1510483</b>	

\* Weights are the DU base weights.

After the DU nonresponse adjustment, in which the ineligible cases were dropped, the total of the adjusted weights for eligible DUs was 1,320,489.

## 11.2.5 Person Level Weighting Factors

### 11.2.5.1 Within-DU Person Weight, $W_{(w)SP}$

The within-DU person weight was computed as

$$W_{(w)SP} = Q_{DU}, \quad (5)$$

where

$Q_{DU}$  = the number of eligible adults in the household based on the screener.

In order to avoid creating any excessively large weights, the value of  $Q_{DU}$  was capped at 4, so that the within-DU weighting factor would never be larger than 4.

After including the within-DU person weight, the total of the adjusted weights for eligible respondents was 2,221,035 (note that this is an estimate of the adult population 18 years of age or older rather than the number of dwelling units as before).

### 11.2.5.2 Adjustment of Person Weights for Nonresponse, $R_{SP}^{NR}$

The overall person-level “base” weight (the product of the first eight terms of equation [1]) was adjusted for extended-interview nonresponse in households where the screening instrument was completed. Adjustment factors were computed for cells defined by age, sex, race/ethnicity, and selected segment-level variables from the 2000 Census block files. The final adjustment cells indicated in Table 11-3 were determined by a CHAID analysis. The person-level nonresponse adjustment,  $R_{SP}^{NR}$ , was computed as the ratio of the weighted count of all sampled SPs in the cell (sampled from a completed screener) to the corresponding weighted count of eligible responding SPs in the cell.

**Table 11-3. Definition of adjustment cells for person-level nonresponse adjustment**

SP non response adjustment cell	Count of eligible persons in DU	Region	% white in segment (2000Census)	% adult in segment (2000Census)	Race/ethnicity of sampled person	% American Indian in segment (2000Census)
1	1	1	All values	All values	All values	All values
2	1	2-4	50% or more	less than 70%	All values	All values
3	1	2-4	50% or more	70% or more	Hispanic; or White alone, not Hispanic; or American Indian alone, not Hispanic	All values
4	1	2-4	50% or more	70% or more	Black alone, not Hispanic; or Other combinations	All values
5	1	2-4	less than 50%	All values	All values	All values
6	2, 4	All values	All values	All values	All values	None; or 5% or more
7	2, 4	All values	All values	All values	All values	More than 0 and less than 5%
8	3, 5, 6	All values	All values	All values	All values	All values

After the person-level nonresponse adjustment, the total of the adjusted weights for respondents was 2,218,110. The mean adjusted person weight was 1239.17, and the coefficient of variation of the adjusted person weights was 65.67 percent. Table 11-4 summarizes the number of responding persons, weighted counts, and the person-level nonresponse adjustment factor for each adjustment cell.

**Table 11-4. Weighted counts\* and person-level nonresponse adjustment factors by adjustment cell**

SP non response adjustment cell	Number of completed interviews in cell	Weighted count of respondents	Weighted count of nonrespondents	Total weighted count	Non response adjustment factor
1	86	58,191	0	58,191	1.00
2	101	76,601	0	76,601	1.00
3	393	313,596	11,785	325,381	1.04
4	60	48,694	0	48,694	1.00
5	78	55,005	5,830	60,835	1.11
6	579	815,883	79,794	895,677	1.10
7	210	356,225	70,418	426,643	1.20
8	130	265,808	60,281	326,089	1.23
<b>Total</b>	<b>1637</b>	<b>1,990,003</b>	<b>228,107</b>	<b>2,218,110</b>	

\* Weights are the person-level base weights.

### 11.2.6 Poststratification Adjustment

A final poststratification adjustment,  $R_{SP}^{PS}$ , was made to align the weighted sample counts to independent population counts derived from the 2007 American Community Survey (ACS). This was accomplished using a ratio-raking algorithm in which the selected marginal totals are iteratively adjusted to agree with the corresponding population counts along a number of dimensions. The two dimensions used in the raking process are summarized in Table 11-5A and 11-5B.

**Table 11-5A. Definition of the first raking dimension for adjusting person-level weights**

<b>Sex</b>	<b>Age Group</b>	<b>Control Totals</b>
Male	18-24	191,393
Male	25-29	128,153
Male	30-49	464,371
Male	50-64	301,965
Male	65+	194,103
Female	18-24	171,403
Female	25-29	122,022
Female	30-49	461,307
Female	50-64	320,614
Female	65+	268,446
<b>Total</b>		<b>2,623,779</b>

**Table 11-5B. Definition of the second raking dimension for adjusting person-level weights**

<b>Race/Ethnicity</b>	<b>Control Totals</b>
Hispanic, any race	152,523
White alone, not Hispanic	1,963,933
Black alone, not Hispanic	178,762
American Indian/Alaska Native alone, not Hispanic	160,130
All other combinations	168,432
<b>Total</b>	<b>2,623,779</b>

Note that the ACS population counts are not available for the subset of counties included in the study. Therefore, to derive the required population control totals for raking, the state-wide totals for Oklahoma from the ACS were adjusted based on the proportion of the 2000 population of the state that is included in our target counties.

The poststratification/raking process was implemented three times to generate three sets of analysis weights: a set for analysis of the cases which received the “main” questionnaire, a set for the cases which received the “scope” questionnaire, and a set for all cases.

The total of the final analysis weights for all respondents was 2,623,779. The mean final weight for all respondents was 1,602.80, and the coefficient of variation of the final weights for all respondents was 56.42 percent.

The total of the final analysis weights for “main” questionnaire respondents was 2,623,779. The mean final weight for “main” questionnaire respondents was 2,400.53, and the coefficient of variation of the final weights for “main” questionnaire respondents was 56.79 percent.

The total of the final analysis weights for “scope” questionnaire respondents was 2,623,779. The mean final weight for “scope” questionnaire respondents was 4,823.12, and the coefficient of variation of the final weights for “scope” questionnaire respondents was 57.49 percent.

Tables 11-6A through 11-6C summarize the weighted counts of respondents before and after poststratification for each of the three sets of weights constructed for analysis.

**Table 11-6A. Weighted counts for the total sample for selected subgroups**

Subgroup*	No. of respondents	NR_adjusted weight	Final poststratified weight	Poststratification Ratio
<b>Sex</b>				
Male	722	1,036,481	1,279,986	1.23
Female	915	1,181,629	1,343,793	1.14
<b>Age</b>				
18 to 24	191	311,447	362,797	1.16
25 to 29	154	221,864	250,175	1.13
30 to 49	567	782,023	925,678	1.18
50 to 64	388	508,832	622,579	1.22
65+	337	393,944	462,549	1.17
<b>Race/ethnicity</b>				
Hispanic	93	134,070	152,523	1.14
White nonHisp.	1,168	1,638,300	1,963,933	1.20
Black nonHisp.	125	145,890	178,762	1.23
Amer. Ind.	140	161,889	160,130	0.99
Other	111	137,951	168,432	1.22
<b>Total</b>	<b>1,637</b>	<b>2,218,100</b>	<b>2,623,779</b>	<b>1.18</b>

\* Subgroup characteristics are based on extended interview data if reported. Otherwise, they are based on data reported in screener.

Table 11-6B. Weighted counts for the “main” questionnaire respondents for selected subgroups

Subgroup*	No. of respondents	NR_adjusted weight	Final poststratified weight	Poststratification Ratio
<b>Sex</b>				
Male	483	692,143	1,279,986	1.85
Female	610	780,033	1,343,793	1.72
	1,093	1,472,176	2,623,779	1.78
<b>Age</b>				
18 to 24	126	201,163	362,797	1.80
25 to 29	104	150,954	250,175	1.66
30 to 49	385	526,410	925,679	1.76
50 to 64	265	346,161	622,579	1.80
65+	213	247,488	462,549	1.87
	1,093	1,472,176	2,623,779	1.78
<b>Race/ethnicity</b>				
Hispanic	61	82,678	152,523	1.84
White nonHisp.	771	1,083,455	1,963,933	1.81
Black nonHisp.	97	110,493	178,762	1.62
Amer. Ind.	90	100,074	160,130	1.60
Other	74	95,475	168,432	1.76
<b>Total</b>	<b>1,093</b>	<b>1,472,176</b>	<b>2,623,779</b>	<b>1.78</b>

\* Subgroup characteristics are based on extended interview data if reported. Otherwise, they are based on data reported in screener.

Table 11-6C. Weighted counts for the “scope” questionnaire respondents for selected subgroups

Subgroup*	No. of respondents	NR_adjusted weight	Final poststratified weight	Poststratification Ratio
<b>Sex</b>				
Male	239	344,338	1,279,986	3.72
Female	305	401,596	1,343,793	3.35
<b>Age</b>				
18 to 24	65	110,284	362,797	3.29
25 to 29	50	70,910	250,175	3.53
30 to 49	182	255,613	925,679	3.62
50 to 64	123	162,670	622,579	3.83
65+	124	146,457	462,549	3.16
<b>Race/ethnicity</b>				
Hispanic	32	51,391	152,523	2.97
White nonHisp.	397	554,845	1,963,933	3.54
Black nonHisp.	28	35,396	178,762	5.05
Amer. Ind.	50	61,825	160,130	2.59
Other	37	42,477	168,432	3.97
<b>Total</b>	<b>544</b>	<b>745,934</b>	<b>2,623,779</b>	<b>3.52</b>

Subgroup characteristics are based on extended interview data if reported. Otherwise, they are based on data reported in screener.

**Appendix A**

**Base Study Survey Administration**

**Appendix A.1**  
**Westat Brochure**





## Our Capabilities



Westat is a professional services organization with an established reputation for quality research and a broad range of capabilities in statistical surveys, program evaluation, technical assistance, epidemiologic studies, clinical trials, and information technology. Specific areas of expertise are as follows:

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<b>Education</b>	<ul style="list-style-type: none"> <li>■ Early Childhood Education</li> <li>■ Elementary and Secondary Education</li> <li>■ Postsecondary and Adult Education</li> <li>■ Special Education</li> <li>■ International Education and Literacy</li> </ul>	<b>Energy</b>
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		<b>Environmental Protection</b>
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		<ul style="list-style-type: none"> <li>■ Family and Child Services</li> <li>■ Research on Aging</li> <li>■ Mental Health Issues</li> <li>■ Homelessness</li> <li>■ Criminal Justice</li> </ul>
		
		<ul style="list-style-type: none"> <li>■ Travel Studies</li> <li>■ Human Factors Research</li> <li>■ Transportation Safety</li> </ul>
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		<ul style="list-style-type: none"> <li>■ Military Health Care</li> <li>■ Military Members/Military Families</li> <li>■ Veterans' and Returning Military Members' Issues</li> </ul>
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## **Appendix A.2**

### **Westat Field Materials**

## **Appendix A.2.1**

### **Missed DU Procedure, Household Screener, and Screener Handcards**

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(INTERVIEWER)

## OKLAHOMA STUDY

LABEL

**INTRO1:** Hello, my name is \_\_\_\_\_ of Westat Research. We recently sent you a letter about the study we are conducting for the State of Oklahoma. Did you receive that letter?

YES.....S1

NO.....INTRO2

**INTRO2:** I'm sorry your household didn't get the letter. Here is a copy, let me review it with you. We are asking people who live in Oklahoma about their opinions about important issues facing the state these days.

S1. First, I would like to verify your address. Is this (READ ADDRESS ON LABEL)? (MAKE MINOR CORRECTIONS TO ADDRESS LABEL, IF NECESSARY. IF AT CORRECT ADDRESS, CONTINUE WITH SCREENER. IF NOT AT CORRECT ADDRESS, THANK RESPONDENT AND END SCREENER.)

YES..... S2  
NO..... END

S2. Are you a member of this household and at least 18 years old?

YES..... INTRO3  
NO..... S3

HOUSEHOLD – MEANS THAT THIS DU IS THE PERSON’S USUAL HOME, AND THAT S/HE HAS NO OTHER USUAL HOME ANYWHERE ELSE.

A HOUSEHOLD EXCLUDES SCHOOL DORMITORIES, NURSING HOMES, VACATION HOMES, AND ANY LIVING QUARTERS WITH MORE THAN 10 UNRELATED ADULTS. IF YOU HAVE REACHED ONE OF THESE, RECORD THE CODE “36” NOT A DU ON THE RECORD OF CONTACTS.

**INTRO3:** Next, I need to ask some questions about you and the people who live here. I will need to set up and use my laptop for the next part of the screener. (SET UP LAPTOP AND LAUNCH INTO SCREENER.)

S3. Is there an adult who lives in this household who is available now whom I could speak to?

YES..... S3a  
NO..... S4

S3a. What is that person's name? And can I speak to that person now?

\_\_\_\_\_

NO..... S4  
YES..... (WHEN ADULT SCREENER RESPONDENT COMES TO  
THE DOOR, REVIEW INTRO 1 AND INTRO 3 AND  
PROVIDE ADVANCE LETTER.)

S4. When would be a good time to call/come back to talk to an adult? Can you give me a telephone number which that person can be reached at? (RECORD ON RECORD OF CONTACTS)



**HIDDEN DU PROCEDURE:**

S5. We want to be sure that every household in this area has been given a chance to participate in this important study. Are there any other living quarters attached to this unit, like a basement or other apartment, that we might have missed?

NO..... (HIDDEN DU PROCEDURE NOT REQUIRED)

YES..... (HIDDEN DU PROCEDURE REQUIRED)

(REVIEW DEFINITION OF A DU AND PROBE, AS NEEDED.)

IF YES, CHECK TO SEE IF THIS/THESE OTHER LIVING QUARTERS MEET THE DEFINITION OF A DU. IF YES, ASK THE SCREENER RESPONDENT:

S6. Can you tell me the street address for this separate dwelling unit/living quarters?

NO..... (TRY AGAIN LATER)

YES..... (RECORD ADDRESS INFORMATION)

---

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BE CERTAIN TO ENTER THIS NEWLY IDENTIFIED HIDDEN DU BY CLICKING ON THE MISSED STRUCTURE BUTTON IN THE OKWS – BROWSE SMS SCREEN AND ENTER THE ADDRESS INFORMATION. THIS CASE IS AUTOMATICALLY IN THE SAMPLE.

### RECORD OF CONTACTS

	DATE	DAY	TIME	RESULT CODE	COMMENTS
Screener			am		
			pm		
			am		
			pm		
			am		
			pm		
			am		
			pm		
			am		
			pm		
			am		
			pm		
Interview			am		
			pm		
			am		
			pm		
			am		
			pm		
			am		
			pm		

**RECORD OF CONTACTS (continued)**

			am		
			pm		
			am		
			pm		
			am		
			pm		
			am		
			pm		

**INTERIM RESULT CODES**

- 01 No Action
- 02 Appointment
- 03 Call Back (no appt.)
- 04 Not Home
- 05 DU not located
- 06 Unavailable
- 07 Refusal
- 08 Broke Appt
- 09 Breakoff – Will Return
- 10 Language Problem
- 11 Vacant
- 12 Other (specify in comments)

**FINAL RESULT CODES**

- 30 Partial Complete
- 31 Complete
- 32 Not Home (Max calls)
- 33 Final Refusal
- 34 Language Problem
- 35 Final Vacant
- 36 Not a DU
- 37 Bad Address
- 38 Other (specify in comments)

**Appendix A.2.2**  
**Advance Letter(s)**

November, 2008

Dear Resident:

Your household has been selected to participate in a scientific study being conducted for the State of Oklahoma by Westat, a research firm based in Maryland.

We hope that a member of your household will be willing to participate in this important study by answering about 40 minutes of questions to be asked by one of our study interviewers in your home. We can provide \$20 as a thank you for your time.

Your participation is voluntary and is critical for the success of the study. Your answers to our questions will be combined with answers from other Oklahoma residents so that we can describe the opinions of the residents of the state.

In about a week, a Westat interviewer will visit your home to select the person who is eligible to participate in the study and to talk with that person

If you have any questions or would like more information about our project, you can call me at our toll-free number, 1-800-937-8281, ext 5195.

Thank you in advance for your help as we carry out this important study for the State of Oklahoma.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Shea". The signature is fluid and cursive, with the first name "Michael" written in a larger, more prominent script than the last name "Shea".

Michael Shea  
Project Director

<<DUID>>

November, 2008

Dear Resident:

Your household has been selected to participate in a scientific study being conducted for the State of Oklahoma by Westat, a research firm based in Maryland. We can't stress enough how important your participation in this study is! You see we have scientifically selected a set of addresses from across the state so that the group of people we interview closely matches all the people living in the state. To be sure that our study produces accurate results, it is very important that every selected household take part. We can't substitute another household for your study, or we will lose critical information.

The purpose of this study is to ask people who live in Oklahoma for their opinions about important issues facing the state these days. Your answers will help the State of Oklahoma understand how the people of Oklahoma feel about problems affecting the state and what they want done to address those problems. Your participation is voluntary and is critical for the success of the study.

We hope that a member of your household will be willing to participate in this important study by answering about 30-40 minutes of questions to be asked by one of our study interviewers in your home. We can provide \$50 as a thank you for your time. A Westat interviewer will visit your home soon to select the person who is eligible to participate in the study and to talk with that person.

If you have any questions or would like more information about our project, you can call me at our toll-free number, 1-800-937-8281, ext 5195. Or call our Field Director, Sherry Sanborne, at the same toll-free number at ext 4399, if I am unavailable.

Thank you in advance for your help as we carry out this important study for the State of Oklahoma.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Shea". The signature is written in a cursive, flowing style.

Michael Shea  
Project Director

### **Appendix A.2.3**

#### **Refusal Conversion Letter(s)**

December 2008

Dear :

I understand that one of our interviewers contacted you about participating in the Oklahoma Study and that you were too busy or not interested in taking part in the study at that time. We can't stress enough how important your participation in this study is! You see we have scientifically selected a set of addresses from across the state so that the group of people we interview closely matches all the people living in the state. To be sure that our study produces accurate results, it is very important that every selected household take part. We can't substitute another household for your study, or we will lose critical information.

The purpose of this study is to ask people who live in Oklahoma for their opinions about important issues facing the state these days. Your answers will help the State of Oklahoma understand how the people of Oklahoma feel about problems affecting the state and what they want done to address those problems.

I have taken the liberty of asking one of our study field interviewers to contact you again in the hope that it will be possible for your household to participate after all. The screener will take only about 5-8 minutes, and the extended interview with a randomly selected adult respondent will take between 30-40 minutes. We can provide **\$50** as a thank you for your time.

If you have any questions or would like more information about our project, you can call me at our toll-free number, 1-800-937-8281, ext 5195. We so hope that your household will be willing to help as we carry out this important study for the State of Oklahoma.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Shea". The signature is written in a cursive, flowing style.

Michael Shea  
Project Director

<<DUID>>

**Appendix A.2.4**  
**“Sorry I Missed You” Card**

*Sorry I missed you*

---

OKLAHOMA STUDY  
WESTAT, INC.

**SORRY I MISSED YOU**

\_\_\_\_\_, I  
visited your home today in connection with  
the Oklahoma Study.

Westat recently sent you a letter explaining the  
study and the importance of your participation.

I am sorry that I did not find you at home  
today. I will try to contact you again in the  
next few days.

**Appendix A.2.5**  
**“No Habla Español” Card**

<p><i>Lamento no haberle encontrado</i></p> <hr/> <p><u>ESTUDIO DE OKLAHOMA</u></p> <p>WESTAT</p>	<p><b>LAMENTO NO HABERLE ENCONTRADO</b></p> <p>_____, visité su casa hoy con motivo del Estudio de Oklahoma.</p> <p>Westat recientemente le envió una carta explicándole el estudio y la importancia de su participación.</p> <p>Lamento no haberle encontrado en su casa el día de hoy. Voy a intentar comunicarme con usted de nuevo en los próximos días.</p>
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**Appendix A.3**

**Westat Validation Form**

Oklahoma Study  
Validation Form

REG: \_\_\_\_\_  
PSU: \_\_\_\_\_  
SEG: \_\_\_\_\_

DUID: \_\_\_\_\_

Interviewer: \_\_\_\_\_

Address: \_\_\_\_\_

City/Town: \_\_\_\_\_

Extended Interview Respondent: \_\_\_\_\_

=====

=

Interview Date (Day): \_\_\_\_/\_\_\_\_/\_\_\_\_ ( ) Interview Time: \_\_\_\_\_

1) Approximately how long was the interview? \_\_\_\_\_

2) What sort of questions did the interviewer ask?

\_\_\_\_\_

\_\_\_\_\_

---

3) Do you remember the name of the interviewer? Please describe him or her?

---

---

**DID THE INTERVIEW VALIDATE? YES OR NO**

Describe: \_\_\_\_\_

---

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## **Appendix A.4**

### **Westat Reports**

## Appendix A.4.1—CIS Data Flow

A list of all addresses in the Zip Codes associated with the sampled PSUs was purchased from a licensed vendor, CIS (Compact Information Systems). This vendor operates under a licensing agreement with the USPS, whereby it receives monthly updates from the USPS to lists of addresses for Carrier Routes for which the vendor initially had at least 90% of the addresses already on its files. Thus these lists are as accurate as USPS lists for the Routes they cover. We asked for residential addresses only, including: addresses on college campuses (where available); any seasonal units; any vacant units; the number of units in any addresses that are apartment complexes, or high-rises; and PO Box throwbacks (these are also known as "holds"; street addresses for households usually getting mail at a PO Box). In this way we could be sure not to miss any addresses that had previously been out of scope but by the time of the study had become in scope. The 90 PSUs contained 94 Zip Codes, (Zip Codes with small populations were combined with neighboring Zip Codes in forming PSUs). Of the 94 Zip Codes, two were reported by CIS as having no addresses in our requested categories, and two were not "owned" by CIS. For the remaining 90 Zip codes, CIS owned approximately 99% of the eligible USPS addresses.

The 713,012 addresses for these remaining 90 Zip Codes purchased from CIS in May 2008 were then geocoded to determine the Census blocks to which they belonged. Geocoding is a computerized process which assigns addresses into Census blocks. In all, 640,880 addresses, which is 90%, were geocodable (i.e., could be assigned into a Census block). The addresses which could not be geocoded were dropped from the list. The addresses which had been successfully assigned to a Census block were sorted by Zip Code and then by block, and the number of addresses per block was created to use in the segment creation and sampling process.

Once the segments were created and a sample of 420 segments was drawn, the selected segments were evaluated for address coverage using the ratio of the number of addresses geocoded into the segment to the number of housing units reported in the 2000 Census. Segments for which this ratio exceeded 75 percent were designated "address list" segments, and the remaining segments were designated "field listing" segments. This resulted in designating 282 of the 420 segments as "address list" segments and the remaining 138 as "field list" segments. The addresses purchased for the "address list" segments formed the frame for sampling individual dwelling units for those segments.

## **Appendix A.4.2—Interviewer Incentive Plans**

In the fifth week of interviewing, Westat implemented an interviewer incentive plan. Every interviewer that completed at least six completed interviews in one week received a Wal Mart gift worth \$50. Every interviewer that completed eight interviews in one week received a &% gift card from Wal Mart. Westat provided thirty eight \$50 gift certificates (which included 3 interviewers who had gotten 5 interviews the previous week as an incentive during that first week we instituted interviewer incentives. There were 6 interviewers who got the \$50 gift certificate, even though they had gotten 8 completes the week of November 3rd -9th, the first week we gave out the interviewer incentives). Nine \$75 gift certificates for interviewers completing 8 or more interviews in a week (starting the week of November 17th-23rd). Two \$100 gift certificates for completing 11 interviews in one week, and one \$150 gift certificates for completing 16 interviews in one week.

### **Appendix A.4.3—Validation**

Validations of completed extended interviews were conducted in the field by the three Field Supervisors and by the Home Office. Periodic queries were run to identify the DUID, the respondent's name and telephone number, the date and time of the interview, the name of the interviewer, and the length of interview time. Interviews that had missing or unlikely telephone numbers were pulled, and contact information was determined through tracing methods, or a Field Supervisor made an in-person visit, as needed. Telephone calls were made to the selected respondent to validate that an interview had been completed, and interviewers verified the critical information provided and probed about the purpose and content of the interview, and about the interviewer in question. Across interviewers, approximately 15% of each interviewer's completed interviews were validated.

## **Appendix A.4.1**

### **Replicate Weighting and Estimation of Variance**

## **1. Replication Approach.**

We prepared replicate weights using a jackknife variance replication estimation method. In this method, variance strata are set up in a way that preserves the sampling features, and cases in each stratum are generally separated into two variance units, again in such a way as to approximately preserve the sources of variation due to sample design features. For each replicate the cases of one variance unit in one stratum are dropped, and the weights for the cases in the remaining variance unit are adjusted to compensate for the deleted unit. Thus in general there are as many replicates as there are variance strata. Each of the weighting adjustments applied to the full sample is then applied to each replicate, resulting in a series of replicate weights that can be attached to each data record for variance estimation.

## **2. Formation of variance strata and variance units.**

For the Oklahoma Watershed Survey, 12 PSUs were selected with certainty and two more had selection probabilities above 80%. The variance contribution from sampled cases in these 14 PSUs would occur primarily at the between-segment level. Therefore the Variance Stratum for segments in these PSUs was established as pairs of segments, setting one of the paired segments as Variance Unit 1 and the other as Variance Unit 2. The sampling variance from the remaining cases would occur at both between and within PSU levels, so the Variance Stratum for cases in these 76 PSUs was established as pairs of PSUs, with cases in one PSU set as Variance Unit 1 and from the other set as Variance Unit 2.

The 14 PSUs treated as certainties had 68 selected segments. However, four segments contained very few cases, so they were combined with another segment to form the variance unit. The final number of variance units in this group was 64, resulting in 32 variance strata of paired variance units.

Generally, the noncertainty PSUs were placed in variance strata based on the PSU sampling strata. Since we drew two PSUs from each stratum each PSU defined a variance unit. The exceptions are the two strata in which one of the PSUs was treated as a certainty for variance estimation purposes. The remaining PSU in each of these strata was assigned to a similar stratum as the third variance unit. There are 37 variance strata among the non-certainty PSUs.

The final number of variance strata is therefore 69 (32 plus 37). The assignment of PSU and segment to Variance Stratum and Variance Unit is given in the table 1.

Table 1. PSU and Segment assignment to Variance Stratum and Variance Unit

Variance Stratum	Variance Unit	PSU	Segment	Second Segment
1	1	179	363	
1	2	179	364	
2	1	179	365	
2	2	179	366	367
3	1	180	368	
3	2	180	369	
4	1	180	370	
4	2	180	371	
5	1	180	372	
5	2	181	373	
6	1	181	374	
6	2	181	375	
7	1	181	376	
7	2	182	377	
8	1	182	378	
8	2	182	379	380
9	1	182	381	
9	2	183	382	
10	1	183	383	
10	2	183	384	
11	1	183	385	
11	2	183	386	
12	1	184	387	
12	2	184	388	
13	1	184	389	
13	2	184	390	
14	1	184	391	
14	2	185	392	
15	1	185	393	
15	2	185	394	
16	1	185	395	
16	2	186	396	
17	1	186	397	
17	2	186	398	
18	1	186	399	
18	2	186	400	
19	1	186	401	
19	2	187	402	
20	1	187	403	
20	2	187	404	

Table 1. PSU and Segment assignment to Variance Stratum and Variance Unit (continued)

Variance Stratum	Variance Unit	PSU	Segment	Second Segment
21	1	187	405	
21	2	187	406	
22	1	188	407	
22	2	188	408	
23	1	188	409	410
23	2	188	411	412
24	1	189	413	
24	2	189	414	
25	1	189	415	
25	2	189	416	
26	1	190	417	
26	2	190	418	
27	1	190	419	
27	2	190	420	
28	1	101	1	
28	2	101	2	
29	1	101	3	
29	2	101	4	
30	1	101	5	
30	2	149	227	
31	1	149	228	
31	2	149	229	
32	1	149	230	
32	2	149	231	
33	1	103	all	
33	2	104	all	
33	3	102	all	
34	1	105	all	
34	2	106	all	
35	1	107	all	
35	2	108	all	
36	1	109	all	
36	2	110	all	
37	1	111	all	
37	2	112	all	
38	1	113	all	
38	2	114	all	
39	1	115	all	
39	2	116	all	
40	1	117	all	
40	2	118	all	
41	1	119	all	
41	2	120	all	
42	1	121	all	
42	2	122	all	
43	1	123	all	

Table 1. PSU and Segment assignment to Variance Stratum and Variance Unit (continued)

Variance Stratum	Variance Unit	PSU	Segment	Second Segment
43	2	124	all	
44	1	125	all	
44	2	126	all	
45	1	127	all	
45	2	128	all	
46	1	129	all	
46	2	130	all	
47	1	131	all	
47	2	132	all	
48	1	133	all	
48	2	134	all	
49	1	135	all	
49	2	136	all	
50	1	137	all	
50	2	138	all	
51	1	139	all	
51	2	140	all	
52	1	141	all	
52	2	142	all	
53	1	143	all	
53	2	144	all	
54	1	145	all	
54	2	146	all	
55	1	147	all	
55	2	148	all	
55	3	150	all	
56	1	151	all	
56	2	152	all	
57	1	153	all	
57	2	154	all	
58	1	155	all	
58	2	156	all	
59	1	157	all	
59	2	158	all	
60	1	159	all	
60	2	160	all	
61	1	161	all	
61	2	162	all	
62	1	163	all	
62	2	164	all	
63	1	165	all	
63	2	166	all	
64	1	167	all	
64	2	168	all	
65	1	169	all	
65	2	170	all	

Table 1. PSU and Segment assignment to Variance Stratum and Variance Unit (continued)

Variance Stratum	Variance Unit	PSU	Segment	Second Segment
66	1	171	all	
66	2	172	all	
67	1	173	all	
67	2	174	all	
68	1	175	all	
68	2	176	all	
69	1	177	all	
69	2	178	all	

### 3. Construction of 69 jackknife replicates and corresponding replicate weights

The number of cases retained in the sample after the second phase of two-phase sampling plus the cases added due to QC procedures is 3,263. The construction of the overall weights is described in Section 11 of the Main Report. It consisted of several main steps: calculating household base weights; adjusting the household weights for household non-response; weighting respondents for within-household sampling; adjusting the respondent weights for respondent nonresponse in responding households; and poststratification of respondent weights to population totals in major demographic categories.

Replicate weights were created and adjusted at each of these major steps. First, the household base weights were calculated for the full sample. These weights were used to calculate replicate base weights as follows: for replicate  $i$  (where  $i$  runs from 1 to 69), either unit 1 or unit 2 from Stratum  $i$  was chosen at random to be given weight 0, while the cases in the other unit in that replicate had their weights doubled. In the case of strata with three variance units, adjustments were made in two different replicates, one corresponding to the stratum number, and one corresponding to half the stratum number. In each of these replicates, one of the three variance units was dropped and weights for cases in each of the other units were multiplied by 1.5.

The second step was nonresponse adjustment for households. Once the nonresponse adjustment cells for the full sample were defined, nonresponse adjustment was applied to each set of replicate weights using the same set of adjustment cells. The within household adjustments were applied to the resulting weights (this is, generally, the number of eligible persons in the household). Next, interview nonresponse adjustments were made in adjustment cells defined for the full sample. As in the household nonresponse adjustment step, the adjustment was applied to the full sample and then separately for each replicate. The final step was poststratification to population totals. Again this

adjustment was run separately for the full sample and for each replicate. Table 2 shows the weighted totals for each replicate at each of the four main weighting steps.

Table 2. Replicate Weighted Totals at Each Weighting Step

Replicate	Total DU Base Weights	Total DU Weights Adjusted for DU Non Response	Total Person Base Weights	Total Person Weights After Stratification (Final Weights)
1	1,510,625	1,320,631	2,220,726	2,623,779
2	1,509,482	1,318,750	2,219,121	2,623,779
3	1,510,483	1,320,489	2,220,686	2,623,779
4	1,511,419	1,321,425	2,222,445	2,623,779
5	1,509,329	1,319,335	2,218,189	2,623,779
6	1,510,483	1,319,947	2,217,052	2,623,779
7	1,509,941	1,320,489	2,220,313	2,623,779
8	1,510,403	1,319,890	2,222,701	2,623,779
9	1,510,868	1,319,947	2,222,132	2,623,779
10	1,511,025	1,321,572	2,218,660	2,623,779
11	1,511,566	1,324,823	2,215,788	2,623,779
12	1,510,147	1,321,787	2,222,373	2,623,779
13	1,509,027	1,319,033	2,222,121	2,623,779
14	1,511,165	1,322,255	2,217,099	2,623,779
15	1,510,418	1,321,412	2,223,150	2,623,779
16	1,509,994	1,320,362	2,221,339	2,623,779
17	1,507,474	1,316,784	2,214,642	2,623,779
18	1,510,222	1,320,731	2,220,235	2,623,779
19	1,510,884	1,319,806	2,218,760	2,623,779
20	1,509,876	1,320,424	2,220,861	2,623,779
21	1,510,739	1,318,578	2,217,974	2,623,779
22	1,510,724	1,320,211	2,222,229	2,623,779
23	1,511,165	1,321,706	2,218,112	2,623,779
24	1,510,396	1,323,111	2,227,597	2,623,779
25	1,510,797	1,320,261	2,219,812	2,623,779
26	1,510,041	1,320,002	2,221,556	2,623,779
27	1,510,996	1,321,536	2,223,276	2,623,779
28	1,514,220	1,324,378	2,226,159	2,623,779
29	1,511,997	1,320,970	2,219,629	2,623,779
30	1,510,212	1,320,727	2,221,303	2,623,779
31	1,510,169	1,320,716	2,220,699	2,623,779
32	1,509,393	1,319,004	2,222,985	2,623,779
33	1,513,250	1,322,344	2,216,887	2,623,779
34	1,510,999	1,322,628	2,216,530	2,623,779
35	1,511,077	1,319,461	2,220,452	2,623,779
36	1,508,538	1,320,792	2,216,930	2,623,779
37	1,505,356	1,317,733	2,224,282	2,623,779
38	1,516,814	1,330,932	2,240,220	2,623,779
39	1,510,508	1,318,078	2,214,620	2,623,779
40	1,506,645	1,316,083	2,230,732	2,623,779

Table 2. Replicate Weighted Totals at Each Weighting Step (continued)

Replicate	Total DU Base Weights	Total DU Weights Adjusted for DU Non Response	Total Person Base Weights	Total Person Weights After Stratification (Final Weights)
41	1,507,502	1,318,092	2,215,510	2,623,779
42	1,509,731	1,317,840	2,228,439	2,623,779
43	1,505,224	1,315,407	2,216,293	2,623,779
44	1,515,042	1,325,109	2,235,311	2,623,779
45	1,511,677	1,320,279	2,215,468	2,623,779
46	1,514,126	1,325,320	2,223,915	2,623,779
47	1,499,040	1,311,127	2,243,229	2,623,779
48	1,499,815	1,310,722	2,204,079	2,623,779
49	1,504,990	1,317,144	2,222,605	2,623,779
50	1,508,192	1,316,415	2,220,228	2,623,779
51	1,515,332	1,324,082	2,223,277	2,623,779
52	1,509,449	1,322,093	2,224,380	2,623,779
53	1,493,466	1,302,388	2,250,100	2,623,779
54	1,513,028	1,323,373	2,229,640	2,623,779
55	1,511,228	1,320,815	2,224,997	2,623,779
56	1,516,575	1,328,402	2,208,022	2,623,779
57	1,502,981	1,315,080	2,213,429	2,623,779
58	1,510,664	1,320,127	2,225,196	2,623,779
59	1,527,199	1,327,009	2,211,231	2,623,779
60	1,516,706	1,327,751	2,235,881	2,623,779
61	1,511,064	1,320,865	2,225,478	2,623,779
62	1,508,169	1,319,695	2,218,831	2,623,779
63	1,503,132	1,316,297	2,218,204	2,623,779
64	1,509,868	1,319,484	2,214,613	2,623,779
65	1,503,620	1,312,681	2,210,033	2,623,779
66	1,514,187	1,325,574	2,212,378	2,623,779
67	1,509,465	1,320,073	2,229,076	2,623,779
68	1,509,923	1,316,549	2,216,580	2,623,779
69	1,520,225	1,327,252	2,231,110	2,623,779
Full Sample	1,510,483	1,320,489	2,221,035	2,623,779

**4. Using the Replicate Weights to Estimate Variances.**

The jackknife replicate method of variance estimation begins by calculating, for the full sample and for each replicate, the weighted estimate of the statistic whose variance is being estimated. Then the difference between the replicate value of the estimate and the full sample value is computed for each replicate, the differences are squared, and these squared differences are summed to estimate the variance of the given statistic. The weighted estimate from the full sample is of course the estimate used for the statistic itself. The square root of the estimated variance estimates the standard error of the statistic, and can be used to construct confidence intervals or to test hypotheses.

### 5. Collapsing Variance Strata to avoid empty Variance Units.

After the full sample weights and replicate weights were calculated, the main variance strata and units defined in Table 1 were collapsed to create a smaller set of strata in which every variance unit had at least one case in the final completed interview data sets for all interviews, main questionnaire interviews and scope interviews. The purpose of the collapsing was to avoid empty variance units when calculating sampling errors using linearization methods that require at least two nonempty variance units per stratum. The collapsing was needed only among the Variance Strata formed within the certainty and near-certainty PSUs, since the Variance Units in those strata consisted of only one or two segments. Table 3, below, shows the collapsing of the Variance Strata and Units into “New Stratum” and “New Unit.”. Table 4 shows the number of cases in the collapsed strata.

Table 3. Collapsing of Variance Strata 1 through 32 into New Strata 1 through 11

Variance Stratum	Variance Unit	New Stratum	New Unit
1	1	1	1
1	2	1	2
2	1	1	1
2	2	1	2
3	1	1	1
3	2	1	2
4	1	1	1
4	2	1	2
5	1	2	1
5	2	2	2
6	1	2	1
6	2	2	2
7	1	3	1
7	2	3	2
8	1	3	1
8	2	3	2
9	1	3	1
9	2	3	2
10	1	3	1
10	2	3	2
11	1	3	1
11	2	3	2
12	1	3	1
12	2	3	2
13	1	4	1
13	2	4	2
14	1	4	1
14	2	4	2
15	1	5	1
15	2	5	2
16	1	5	1

Table 3. Collapsing of Variance Strata 1 through 32 into New Strata 1 through 11 (continued)

Variance Stratum	Variance Unit	New Stratum	New Unit
16	2	5	2
17	1	5	1
17	2	5	2
18	1	5	1
18	2	5	2
19	1	6	1
19	2	6	2
20	1	6	1
20	2	6	2
21	1	6	1
21	2	6	2
22	1	6	1
22	2	6	2
23	1	7	1
23	2	7	2
24	1	8	1
24	2	8	2
25	1	8	1
25	2	8	2
26	1	8	1
26	2	8	2
27	1	8	1
27	2	8	2
28	1	9	1
28	2	9	2
29	1	9	1
29	2	9	2
30	1	10	1
30	2	10	2
31	1	11	1
31	2	11	2
32	1	11	1
32	2	11	2
33	1	33	1
33	2	33	2
33	3	33	3
34	1	34	1
34	2	34	2
35	1	35	1
35	2	35	2
36	1	36	1
36	2	36	2
37	1	37	1
37	2	37	2
38	1	38	1
38	2	38	2

Table 3. Collapsing of Variance Strata 1 through 32 into New Strata 1 through 11 (continued)

Variance Stratum	Variance Unit	New Stratum	New Unit
39	1	39	1
39	2	39	2
40	1	40	1
40	2	40	2
41	1	41	1
41	2	41	2
42	1	42	1
42	2	42	2
43	1	43	1
43	2	43	2
44	1	44	1
44	2	44	2
45	1	45	1
45	2	45	2
46	1	46	1
46	2	46	2
47	1	47	1
47	2	47	2
48	1	48	1
48	2	48	2
49	1	49	1
49	2	49	2
50	1	50	1
50	2	50	2
51	1	51	1
51	2	51	2
52	1	52	1
52	2	52	2
53	1	53	1
53	2	53	2
54	1	54	1
54	2	54	2
55	1	55	1
55	2	55	2
55	3	55	3
56	1	56	1
56	2	56	2
57	1	57	1
57	2	57	2
58	1	58	1
58	2	58	2
59	1	59	1
59	2	59	2
60	1	60	1
60	2	60	2
61	1	61	1

Table 3. Collapsing of Variance Strata 1 through 32 into New Strata 1 through 11 (continued)

Variance Stratum	Variance Unit	New Stratum	New Unit
61	2	61	2
62	1	62	1
62	2	62	2
63	1	63	1
63	2	63	2
64	1	64	1
64	2	64	2
65	1	65	1
65	2	65	2
66	1	66	1
66	2	66	2
67	1	67	1
67	2	67	2
68	1	68	1
68	2	68	2
69	1	69	1
69	2	69	2

Table 4. Completed cases in New Strata and New Units

New Stratum	New "PSU"	Sum of All cases	Sum of Main cases	Sum of Scope Cases
1	1	11	8	3
	2	14	10	4
2	1	6	5	1
	2	8	4	4
3	1	11	8	3
	2	10	7	3
4	1	7	3	4
	2	12	10	2
5	1	15	11	4
	2	16	10	6
6	1	10	6	4
	2	24	18	6
7	1	5	2	3
	2	7	4	3
8	1	19	15	4
	2	18	12	6
9	1	7	5	2
	2	14	8	6
10	1	6	4	2
	2	5	3	2
11	1	11	6	5
	2	5	4	1

Table 4. Completed cases in New Strata and New Units (continued)

New Stratum	New "PSU"	Sum of All cases	Sum of Main cases	Sum of Scope Cases
33	1	14	8	6
	2	14	9	5
	3	15	8	7
34	1	11	9	2
	2	16	14	2
35	1	23	15	8
	2	20	12	8
36	1	23	14	9
	2	26	16	10
37	1	6	5	1
	2	12	8	4
38	1	14	11	3
	2	12	4	8
39	1	10	6	4
	2	11	7	4
40	1	19	12	7
	2	15	8	7
41	1	9	6	3
	2	11	7	4
42	1	11	9	2
	2	11	9	2
43	1	9	7	2
	2	20	11	9
44	1	22	17	5
	2	20	12	8
45	1	17	13	4
	2	10	7	3
46	1	28	20	8
	2	19	14	5
47	1	28	15	13
	2	17	11	6
48	1	13	9	4
	2	28	19	9
49	1	14	8	6
	2	10	5	5
50	1	8	7	1
	2	18	13	5
51	1	18	16	2
	2	15	9	6
52	1	29	18	11
	2	18	13	5
53	1	26	18	8
	2	31	21	10

Table 4. Completed cases in New Strata and New Units (continued)

New Stratum	New "PSU"	Sum of All cases	Sum of Main cases	Sum of Scope Cases
54	1	17	13	4
	2	22	11	11
55	1	18	12	6
	2	20	12	8
	3	14	10	4
56	1	21	14	7
	2	16	10	6
57	1	24	15	9
	2	15	11	4
58	1	17	10	7
	2	21	14	7
59	1	15	8	7
	2	22	14	8
60	1	21	14	7
	2	36	24	12
61	1	20	12	8
	2	28	21	7
62	1	20	15	5
	2	25	17	8
63	1	11	6	5
	2	16	11	5
64	1	27	19	8
	2	12	9	3
65	1	15	11	4
	2	26	15	11
66	1	32	24	8
	2	17	13	4
67	1	10	7	3
	2	24	17	7
68	1	14	11	3
	2	18	11	7
69	1	34	25	9
	2	27	14	13
Grand Total		1637	1093	544

## **Appendix A.5**

### **Response Rates by Preliminary Sampling Units**

## RESPONSE RATES

Table A-1 summarizes unweighted and weighted counts of sampled cases by final screener and extended interview response status. The composition of the various response status groups shown in the table is indicated by the two-digit status codes given in parentheses after the description of the particular group. A summary of the detailed status codes used to define the response status groups is given in Table A-2.

As discussed in Section 3.1, the initially-selected sample of over 4,000 dwelling units was reduced by randomly deselecting about 900 cases that had not been completed or otherwise finalized at the time the decision was made to reduce the sample size. To take account of the deselection process in the calculation of response rates, “weights” were assigned to the cases that had been eligible for deselection and retained in the final (reduced) sample. The weight assigned to these cases was equal to the reciprocal of the probability of retaining the case for the reduced sample, or approximately 1.4. Note, in particular, that cases that had completed the screener prior to the time the deselection was done were retained in the sample with certainty and thus have a weight of 1.0 in the response rate calculations.

As can be seen in the table, there are two components of the final (weighted) response rate: the screener response rate and the (conditional) extended interview response rate. Of the 3,263 dwelling units in the final sample, 378 were determined to be ineligible (e.g., vacant or non-DUs). On a weighted basis, these accounted for 12.4 percent of the (weighted) sample. Of the remaining 2,885 eligible DUs, 1,793 completed the screener for a weighted screener response rate of 58.4 percent.

Within each of the 1,793 DUs completing the screener, one eligible adult was selected for the extended interview. Of the 1,793 sampled persons, three were later determined to be ineligible (e.g., sampled person was under 18 years of age; the DU was no longer occupied). Of the remaining 1,790 eligible persons, 1,637 completed the extended interview for a weighted (conditional) extended interview response rate of 91.7 percent. The overall weighted extended interview response rate was therefore 53.6 percent ( $58.4\% \times 91.7\%$ ).

Also shown in the table are results of the extended interview for the main and scope questionnaires. The weighted (conditional) response rates for the main and scope questionnaires were 91.8 percent and 91.6 percent, respectively. Thus, the overall weighted extended interview response rates for the two questionnaire types were essentially the same for the combined questionnaire at 53.6 percent ( $58.4\% \times 91.8\%$ ) and 53.5 percent ( $58.4\% \times 91.6\%$ ), respectively.

Finally, the corresponding screener and extended interview response rates by PSU are summarized in Table A-3.

Table A-1. Number of cases by response status and weighted response rates

Sampling unit/response status groups*	Unwtd. count	Unwtd. Rate	Wtd. count	Wtd. Rate
Sampled dwelling units (after deselection)**	3,263	—	4,117	—
1. Completed screeners (81, 83)	1,793	54.9%	2,106	51.2%
2. Eligible screener nonrespondents (32, 33, 34, 38, 40, 91, 94)	1,092	33.5%	1,500	36.4%
3. Ineligible dwelling unit (35-37)	378	11.6%	511	12.4%
ELIGIBILITY STATUS DETERMINED IN SCREENER	3,263	100.0%	<b>4,117</b>	<b>100.0%</b>
COMPLETED SCREENERS AMONG ELIGIBLE CASES	1,793	62.1%	<b>2,106</b>	<b>58.4%</b>
SCREENER RESPONSE RATE (RR1)	—	—	—	<b>58.4%</b>
Sampled persons among cases completing screener	1,793	—	2,106	—
1. Completed extended interview (83)	1,637	91.3%	1,929	91.6%
<i>Main</i>	1,093	91.4%	1,293	91.6%
<i>Scope</i>	544	91.1%	668	91.6%
2. Did not complete extended interview (32, 33, 34, 38, 40, 91, 94)	153	8.5%	174	8.3%
<i>Main</i>	100	8.4%	116	8.2%
<i>Scope</i>	53	8.9%	53	8.4%
3. Ineligible (35-37)	3	0.2%	3	0.2%
<i>Main</i>	3	0.3%	3	0.2%
<i>Scope</i>	0	0.0%	0	0.0%
CONDITIONAL EXTENDED INTERVIEW RESPONSE RATE (RR2)	—	—	—	<b>91.7%</b>
<i>Main</i>	—	—	—	<b>91.8%</b>
<i>Scope</i>	—	—	—	<b>91.6%</b>
OVERALL EXTENDED INT. RESPONSE RATE = RR1 * RR2	—	—	—	<b>53.6%</b>
<i>Main</i>	—	—	—	<b>53.6%</b>
<i>Scope</i>	—	—	—	<b>53.5%</b>

\* The specific status codes used to define various response status groups are given in parentheses after the description of the group. See Table A-2 for definition of survey result codes.

\*\*See Section 3.1 for description of the sample reduction process.

Table A-2. Definition of survey result codes

Result Code	Label/Description
32	32[F]-Not Home [Max calls]
33	33[F]-Final Refusal
34	34[F]-Language Problem
35	35[F]-Final Vacant
36	36[F]-Not a DU
37	37[F]-Bad Address
38	38[F]-Other [specify in comments]
40	40[F]-Too ill/Unavailable
81	81[I]-Complete screener but no extended interview
83	83[F]-Complete screener and extended interview
91	91[F]-Complete scr., but data lost due to machine problem
94	94[F]-Complete w/Falsify

Table A-3. Unweighted counts of sample by response status and weighted survey response rates by PSU

PSU	Total sample*	Screener			Extended interview		Weighted response rates†		
		Resp.	Non- resp.	Ineligible	Resp.	Non- resp.	Screener	Ext. int. (cond.)	Overall
101	42	29	11	2	27	2	68.46%	92.44%	63.29%
102	27	16	7	4	15	1	63.60%	91.82%	58.40%
103	29	14	14	1	14	0	47.84%	100.00%	47.84%
104	22	14	7	1	14	0	66.67%	100.00%	66.67%
105	35	14	13	8	11	3	51.85%	78.57%	40.74%
106	39	20	14	5	16	4	52.78%	81.85%	43.20%
107	42	23	17	2	23	0	55.23%	100.00%	55.23%
108	41	22	14	5	20	2	60.80%	92.12%	56.01%
109	41	26	13	2	23	3	59.79%	88.98%	53.20%
110	38	27	5	6	26	1	83.94%	96.17%	80.73%
111	33	8	22	3	6	2	24.09%	76.21%	18.36%
112	38	16	15	7	12	4	47.16%	76.62%	36.14%
113	32	15	8	9	14	1	61.32%	92.11%	56.48%
114	46	16	29	1	12	4	30.09%	74.41%	22.39%
115	30	13	17	0	10	3	39.63%	80.58%	31.94%
116	30	13	12	5	11	2	47.09%	86.70%	40.83%
117	38	19	15	4	19	0	52.21%	100.00%	52.21%
118	31	15	11	5	15	0	51.78%	100.00%	51.78%
119	23	9	11	3	9	0	42.94%	100.00%	42.94%
120	30	11	15	4	11	0	40.60%	100.00%	40.60%
121	34	13	15	6	11	2	39.54%	85.53%	33.82%
122	30	12	15	2	11	1	39.07%	90.25%	35.26%
123	42	9	29	4	9	0	23.10%	100.00%	23.10%
124	40	22	14	4	20	2	56.52%	91.68%	51.82%
125	34	22	10	2	22	0	68.75%	100.00%	68.75%
126	46	21	23	2	20	1	41.99%	95.74%	40.20%
127	38	18	11	9	17	1	56.90%	95.11%	54.11%
128	29	11	12	6	10	1	43.56%	92.33%	40.22%
129	35	30	2	3	28	2	93.39%	93.95%	87.74%
130	34	22	6	6	19	3	75.24%	88.32%	66.45%
131	45	33	9	3	28	5	76.81%	84.20%	64.67%
132	29	19	10	0	17	2	64.08%	92.04%	58.98%
133	36	13	20	3	13	0	39.56%	100.00%	39.56%
134	42	28	10	4	28	0	75.97%	100.00%	75.97%
135	33	14	18	1	14	0	43.15%	100.00%	43.15%
136	34	11	18	5	10	1	36.01%	90.13%	32.46%
137	29	9	15	5	8	1	34.77%	87.25%	30.33%
138	37	19	16	2	18	1	51.04%	94.01%	47.98%
139	31	20	10	1	18	2	63.49%	88.50%	56.19%

*table continues*

Table A-3. Unweighted counts of sample by response status and weighted survey response rates by PSU  
(continued)

PSU	Total sample*	Screener			Extended interview		Weighted response rates†		
		Resp.	Non-resp.	Ineligible	Resp.	Non-resp.	Screener	Ext. int. (cond.)	Overall
140	38	16	19	3	15	1	41.34%	94.70%	39.15%
141	44	35	8	1	29	6	75.65%	82.86%	62.68%
142	41	18	16	7	18	0	45.96%	100.00%	45.96%
143	38	26	9	3	26	0	72.21%	100.00%	72.21%
144	60	31	28	1	31	0	54.04%	100.00%	54.04%
145	30	18	8	4	17	1	66.62%	95.55%	63.66%
146	41	22	15	4	22	0	53.65%	100.00%	53.65%
147	39	21	13	5	18	3	56.28%	86.98%	48.95%
148	31	20	6	5	20	0	74.31%	100.00%	74.31%
149	44	29	9	6	21	8	71.94%	68.07%	48.97%
150	32	16	12	4	14	1	55.26%	91.93%	50.80%
151	43	26	12	5	21	5	64.90%	82.26%	53.39%
152	31	22	1	8	16	5	94.28%	75.67%	71.34%
153	45	24	13	8	24	0	60.18%	100.00%	60.18%
154	32	18	10	4	15	3	59.22%	83.33%	49.35%
155	39	19	18	2	17	2	45.76%	88.55%	40.52%
156	40	23	14	3	21	2	55.95%	92.01%	51.48%
157	30	16	12	2	15	1	55.77%	93.39%	52.08%
158	57	23	16	18	22	1	54.91%	94.47%	51.87%
159	33	23	7	3	21	2	72.08%	90.54%	65.26%
160	46	38	7	1	36	2	81.74%	95.47%	78.03%
161	33	24	6	3	20	3	77.48%	87.22%	67.58%
162	39	30	5	4	28	2	82.48%	92.29%	76.12%
163	35	22	12	1	20	2	59.13%	90.15%	53.30%
164	36	25	7	4	25	0	76.87%	100.00%	76.87%
165	20	13	3	4	11	2	77.60%	86.33%	66.99%
166	32	16	5	11	16	0	70.48%	100.00%	70.48%
167	34	27	3	4	27	0	89.16%	100.00%	89.16%
168	35	13	19	3	12	1	38.39%	91.55%	35.15%
169	27	17	4	6	15	2	80.95%	88.24%	71.43%
170	44	29	11	4	26	3	67.58%	89.16%	60.26%
171	52	38	9	5	32	6	74.99%	84.21%	63.15%
172	35	17	11	7	17	0	60.71%	100.00%	60.71%
173	30	12	15	3	10	2	39.22%	82.34%	32.29%
174	38	25	8	5	24	1	72.72%	94.94%	69.04%
175	29	15	6	8	14	1	68.45%	94.27%	64.53%
176	28	19	9	0	18	1	64.95%	95.74%	62.19%
177	53	34	13	6	34	0	68.80%	100.00%	68.80%
178	35	28	6	1	27	1	83.70%	95.72%	80.11%

table continues

Table A-3. Unweighted counts of sample by response status and weighted survey response rates by PSU  
(continued)

PSU	Total sample*	Screener			Extended interview		Weighted response rates†		
		Resp.	Non- resp.	Ineligible	Resp.	Non- resp.	Screener	Ext. int. (cond.)	Overall
179	32	10	19	3	10	0	32.43%	100.00%	32.43%
180	44	27	17	0	18	9	53.74%	66.18%	35.56%
181	27	14	11	2	14	0	56.00%	100.00%	56.00%
182	28	5	20	3	3	2	20.00%	60.00%	12.00%
183	34	10	17	7	8	2	37.04%	80.00%	29.63%
184	39	20	13	6	19	1	56.39%	94.05%	53.04%
185	34	18	7	9	17	1	66.10%	94.80%	62.66%
186	48	25	14	9	22	3	57.83%	87.40%	50.54%
187	41	27	9	5	25	2	70.88%	93.30%	66.13%
188	27	14	11	2	13	1	49.56%	93.43%	46.31%
189	42	27	9	6	25	2	69.31%	93.02%	64.47%
190	33	22	6	5	19	3	74.93%	87.52%	65.58%
Total	3,263	1,793	1,092	378	1,637	153	58.41%	91.73%	53.58%

\* Counts are final unweighted counts after sample reduction (see Section 3.1).

† Weighted to account for sample reduction.